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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/817,563	04/02/2004	John A. McFarland	H0004908	3803

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EXAMINER

QUACH, TUAN N

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 07/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/817,563

Applicant(s)

MCFARLAND ET AL.

Examiner

Tuan Quach

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 8-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


Tuan Quach
Primary Examiner

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/19/06 & 4/2/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Applicant's election with traverse of claims 1-7 in the reply filed on May 2, 2006 is acknowledged. The traversal is on the ground(s) that the restriction is deficient because the inventions are not independent and that the field of search would require search in both groups. This is not found persuasive because applicant has failed to address the reasons delineated in the restriction requirement. In particular, applicant fails to consider that inventions I and II are related as product and process of use wherein the inventions can be shown to be distinct if either or both of the following. can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or, (2) the product as claimed can be used in a materially different process of using that product (MPEP 806.05(h)). In the instant case the product as claimed can be used to remove oxides from other surfaces such as from silicon substrate. The process as claimed can be used to make another and materially different product, e.g., one without carboxylic acids or with a different composition thereof. Furthermore, applicant fails to consider that because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper. The requirement is still deemed proper and is therefore made FINAL.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 2826

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dao et al. 5,824,601 (Dao) in view of Ohmi et al. 5,277,835 (Ohmi).

Re claims 1-4, Dao teaches silicon oxide etching solution consisting of bifluoride source compound in solvent consisting of carboxylic acids, e.g., acetic acid (column 2 lines 43-60) wherein relative weight percent of 9% of water, 83% acetic acid (density ~1.0) and 8% HF (mw 20.0), thus substantially meeting the relative ratio of the claimed range regarding the carboxylic acids. It would have been obvious to one skilled in the art to have optimized the amount of water, including reducing such amount to 1 to 5% and of hydrofluoric to about 3% since such reduction in amount of water would serve to achieve etch selectivity, column 3 lines 41-60. The optimization of water thus would have been obvious since Dao recognized such as corresponding to a result-effective variable, i.e., a variable which achieves a recognized result, namely enhanced selectivity, thereby rendering to the optimization of workable ranges of said variable

routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy).

The reduction of hydrofluoric acid to be is between 0.5 and 3 % by solution weight would have been obvious given that about 8% is explicitly taught by Dao as delineated, (corresponding to 6:1 ratio within a preferred range of 4:1 and 8:1 ration of carboxylic acid to aqueous hydrofluoric acid. Note particularly the teachings of Dao, column 2 lines 49-52 wherein the ratio is not critical and wherein the preferred ratio can be varied as well, including between 4:1 and 8:1 parts by volume of carboxylic acid to aqueous hydrofluoric acid. The optimization of the hydrofluoric acid composition to be within the claimed range, namely of 0.5 to about 3% would have been obvious since differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (Claimed process which was performed at a temperature between 40°C and 80°C and an acid concentration between 25% and 70% was held to be prima facie obvious over a reference process which differed from the claims only in that the reference process was performed at a temperature of 100°C and an acid concentration of 10%.); see also Peterson, 315 F.3d at 1330, 65 USPQ2d at 1382 ("The normal desire of scientists or artisans to improve upon what is already generally known provides the

Art Unit: 2826

motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.”); *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969) (Claimed elastomeric polyurethanes which fell within the broad scope of the references were held to be unpatentable thereover because, among other reasons, there was no evidence of the criticality of the claimed ranges of molecular weight or molar proportions.). For more recent cases applying this principle, see *Merck & Co. Inc. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); *In re Kulling*, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990); and *In re Geisler*, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997). Additionally, such selection of the range of the hydrogen fluoride would have been further obvious given the teachings of the range taught in Ohmi, the abstract, Figs. 8-10, column 3 lines 20 to 25, wherein the such optimization of the HF concentration can be utilized to obtain the desired etching rate.

Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dao and Ohmi as applied to claims 1-4 above, and further in view of Yates 2004/0250835 A1 and Jaganathan et al. 6,200,891 B1.

Dao and Ohmi are applied as above and lacks primarily the recitations of the various alternatives of fluoride sources enumerated in claim 4 and organic nitrogen containing compounds in claim 7.

Yates teaches composition for cleaning surface employing fluorine comprising compounds wherein inorganic fluoride such as HF and ammonium fluoride, or organic fluoride compounds can be employed. See (0005)-(00413).

Jagannathan teaches selective removal of oxides including composition including suitable fluoride containing compound, e.g., column 2, lines 14 to column 8 lines 11, particularly column 3, lines 22-38, column 6 lines 19-24, wherein the various fluoride containing compounds include fluoboric acid, ammonium fluoride, tetrabutylammonium tetrafluoroborate, aluminum hexafluoride, and may include various organic nitrogen containing compounds, e.g., column 4 lines 50-58 to facilitate removal of photoresist residues. The selection of suitable composition is also taught, column 3 lines 22-60 including suitable molarity of the fluorine compound and water.


It would have been obvious to one skilled in the art in practicing Dao et al. to have employed alternatives fluorides including suitable inorganic fluorides such as ammonium fluoride, and suitable organic fluorides since such is conventional and advantageous to provide improved cleaning composition having controlled removal rate and selectivity as taught by Yates, e.g. (0005J, (0006), (0009), (001 1), (0021), (0029), (0038), 0041) and in Jagannathan as delineated above, wherein it would have been obvious to one skilled in the art to have selected and optimized the suitable compositions as in claim 6 in order to achieve desired selectivity and removal time as taught by the prior art at portions delineated above. It would have been conventional and obvious to have selected suitable and conventional organic nitrogen containing sources including those enumerated in claim 7 given the teachings of Jaganathan wherein the removal of photoresist residues can be facilitated.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Maternagha 5,496,485, Small et al. 2002/0037820 A1, Li et al. 6,192,899 B1 are made of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Tuan Quach whose telephone number is 571-272-1717. The examiner can normally be reached on M-F from 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Nathan Flynn, can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Tuan Quach
Primary Examiner